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ABSTRACT

This analysis of 1,200 educational research and development projects taken from the U.S. Office of Education's "Current Project Resumes, July 1970" was made to determine the crucial objectives or activities which have a direct effect on project costs, as part of the planning for the National Institute of Education. Projects were categorized according to the kind of output: theoretical, analytical, and experimental studies; surveys; evaluations;developmental projects; training programs in educational research; conferences, workshops, and symposiums; and research and development centers and regional laboratories. Categories were divided into subgroups according to project cost and were subsequently analyzed for common cost-differentiating characteristics. Flow charts using sequential questions were developed for sorting the projects into their appropriate cost groups. Eight percent of the projects studied did not fit the classification scheme; that is, they were sorted into one group on the basis of their cost and into a different group on the basis of their descriptive characteristics. The classification scheme is limited by the accuracy of the data reported in the project resumes with regard to a) adequacy of funding level, b) quality of investigator or project outcome, and c) amount of supplementary funding from sources other than the Office of Education. (HMD)

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COST MODELS FOR EDUCATIONAL R&D PROJECTS

Arnold Lieberman

A WORKING NOTE
prepared for the

DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE

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2005
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PREFACE

In the spring of 1971, the Commissioner of Education's Planning Unit for the proposed National Institute of Education asked Rand to prepare an analysis on alternative management methods and procedures for conducting research and development. The project was also to include a series of cost models descriptive of past educational R&D projects and useful for the planning of new R&D programs by the proposed institute. This working note is directed toward the latter task.

Dependence on a limited data base of Office of Education funded R&D projects led to the development of cost models in the form of heuristic rules, or general rules of thumb, rather than in the form of quantitative formulations. These cost rules provide the basis for placing any educational R&D project, according to its major objectives and component activities, into a specified cost range.

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I. INTRODUCTION

Guidelines to the costs of prospective R&D projects, both individually and aggregated to major educational programs, are valuable tools for educational planners. Given an estimated future budget, planners may use these guidelines to determine how many of the various kinds of R&D activity may be afforded. Conversely, given a desired package of specified R&D projects, planners may use the guidelines to estimate the associated costs of the package.

Any guidelines that may currently exist are in the form of general heuristics, or rules of thumb. For example, a heuristic may be that development projects cost about ten times more than analytical studies, or that educational R&D projects which involve more than ten man-years effort cost disproportionately more than projects utilizing less effort. Unfortunately, almost no validated general rules such as the above are well known or documented. Educational cost-estimators may use their own implicit rules of thumb in approving cost estimates of various R&D projects, but a validated Handbook of general cost-estimating principles is not yet developed, despite the great value that such a Handbook would provide.

This paper is the first step toward such a Handbook. It is an analysis of a large set of actual educational R&D projects for the purpose of determining what are the crucial objectives or project activities which tend to make projects cost what they do.

INPUT VERSUS OUTPUT ORIENTED COST MODELS

Cost models which are directed toward the input side of R&D projects merely redescribe the project costs and add no new information concerning the reasons why the stated amount of resources are required. Unfortunately, many cost models are exactly of this type. Given a set of input variables such as the

number of man-years required, they provide the proper cost factors to use in calculating the total project cost. But why is that particular amount of man-years required in the first place?

In contrast, an output oriented cost model focuses on what the project is trying to do, its objectives and proposed activities, as guides to what the project will cost. The assumption, for example, is that projects which are surveys are basically different from projects which are research training programs or projects which involve curriculum development, and should require different costs for different reasons.

The analysis for such an output oriented cost model requires two kinds of data: the cost of projects and some kind of description of their objectives and activities. Objectives in the forms of "improving education," or "adding to the knowledge of learning disabilities" give little indication of reasons underlying project costs. More informative objectives are: developing materials for new curricula, conducting a literature review or controlled experiment, surveying a selected population for specified characteristics, or running a national conference for a five day period. Additional cost related information is provided by statements of the actual activities that will be conducted in pursuit of these objectives: surveying by interview to three hundred people or by questionnaire to three thousand people, experimenting for which new equipment need by designed and tested, and developing materials and including teacher training in their use, evaluation of their effects, and dissemination of their results.

The inclusion of certain of these kinds of activities may provide an indication of relatively higher cost. But since the cost figure provided is usually either total project cost or cost breakdown into functional components such as salary and travel, it is impossible to tell how much of the total project cost is directed specifically toward evaluation, training, or other activities. Consequently, an analysis of the data may show that development projects which include

evaluations may cost more than development projects which do not, but it cannot show how much evaluations for development projects cost. This is true because many different kinds of things are being developed, and some projects include other kinds of activity, such as training, as well.

The key to any output oriented cost model is classification, where classes are based on characteristics which seem to effect the cost of the project. The analysis required for such a classification is simply a systematic search for those characteristics. This paper presents (1) the preliminary results of such a search, (2) the resulting classification of educational R&D projects into cost groups on the basis of such a classification, and (3) for each project category, a simple flow chart of questions or characteristics which can be used to sort any educational R&D project into its cost group.

THE DATA BASE

The entire set of projects used in this analysis was taken from the Office of Education's Current Project Resumes, July 1970. Over twelve hundred project descriptions contained in this report were individually studied and used in the development of the classification scheme, until all the projects contained in the report were sorted into their appropriate classes.

The resulting analysis and classification scheme is limited both by the accuracy of the cost figures provided in the report and by the descriptive quality of the project resumes. Of the twelve hundred fifteen project descriptions used, only fifty-seven were either distinctively unique, or insufficiently informative concerning the reasons for cost magnitude to be included in the project categories. Limitations on the accuracy of costs focus on three issues: (1) Adequacy: No indications are provided by the data that projects were neither overfunded nor underfunded with respect

to meeting their project objectives. (2) Quality: No indications are provided by the data regarding the level of quality of either investigator or project outcome. (3) Joint Funding: No indications are provided by the data of supplementary funding by other agencies, though instances of this situation are probably few.

ORGANIZATION OF THE PAPER

The paper is divided into nine main sections, according to the division of R&D projects into categories on the basis of objectives and activities. Each section contains three parts:

1. A list of the descriptive characteristics, and their operational definitions specific to the project category. These are used to sort projects into the various cost groups.
2. A list of the cost groups for the category, and the associated descriptive characteristics which are common to each group.
3. A flow chart for costing projects of the category, consisting of the systematic sorting of projects into their cost group on the basis of descriptive characteristics.

Descriptive Characteristics

These are the bases for sorting projects into cost groups. They may refer to scale: number of interviews, number of participants, length of program, size of added staff; inclusion of activities: evaluation included, teacher training included, design of equipment included; scope of objective: overall evaluation, or impact on one or two specified variables; development of materials for a total

curriculum, or for only one course; methodology: laboratory experimentation, or literature search; questionnaire, or interview; focus: organizational efficiency, or classroom conduct; development of subject content, or of testing procedures; program planning, or demonstration and dissemination; adding staff, or adding space and equipment; and type: seminar, or conference; ERIC center, or regional lab; training institute, or Ph.D. program; high school course, or college course; project evaluation, or program evaluation.

Cost Groups

Cost groups vary in number of groups and cost spans, across project categories. The number of groups reflects the cost discriminating powers of the descriptive characteristics; more groups indicating a greater ability to explain cost differences in terms of the characteristics. Some cost groups contain specific spans; e.g., $10,000 to $50,000, while other groups merely identify general level; e.g., over $1,000,000.

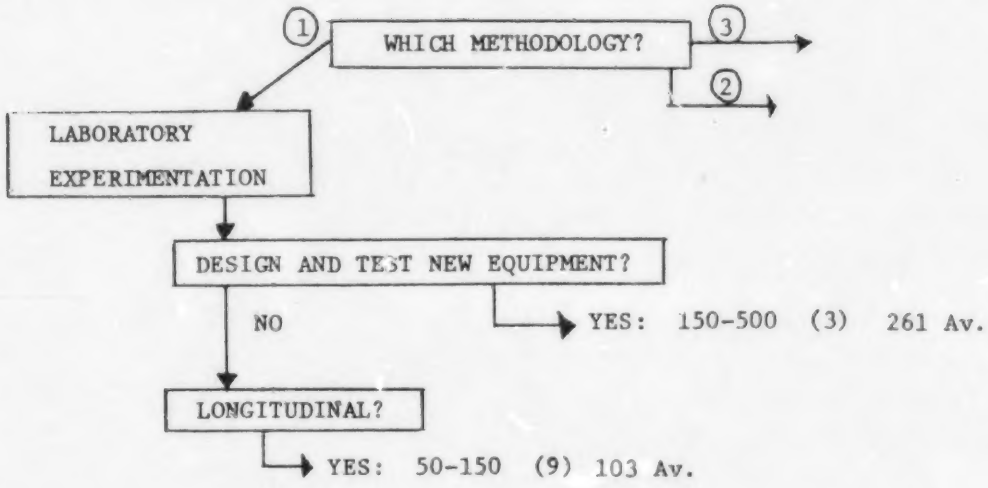
Associated with each cost group is a list of the descriptive characteristics which are common to that group, and the number of projects found which fall within the cost span.

Flow Charts

The flow charts are a more useful way of presenting the information provided in the cost groups. By sequentially asking questions concerning the descriptive characteristics of the projects, these charts sort the projects into their appropriate cost group, indicated on the flow chart in thousands of dollars. Additional data is provided concerning how many projects of the data base are sorted into the cost groups for the stated reasons, and the average project cost within that cost group.

For example, part of the flow chart for costing projects of the category: Theoretical, Analytical, and Experimental Studies,

is reproduced below:



A project which is placed in the category of Theoretical, Analytical, and Experimental Studies, and which uses laboratory experimentation as its methodology, which involves no design and testing of new equipment, and which is longitudinal, falls into the $50,000 to $150,000 cost group. Furthermore, this classification is based on 9 different projects found in the data base which both display these same characteristics and which cost between $50,000 and $150,000.

One distinctive feature of these flowcharts is the importance of the order of discriminating questions. All projects are sorted into the first cost group possible. For example, in the above case, projects which include the design and test of new equipment fall into the $150,000 to $500,000 cost group whether they are longitudinal or not. In terms of sorting, earlier questions always take precedence over later ones.

Organization of data for the development of these flow charts is facilitated by using data matrices such as those listed in the Appendix for each R&D category. Individual projects are described

by a single column in this appropriate matrix. Down the left-hand side of the matrix are the descriptive characteristics used to sort projects into cost groups. "X"s or numbers within the matrix indicate satisfaction of the characteristic by the appropriate project. The bottom row of the matrix provides space for project costs.

LIMITATIONS OF THE COST MODEL

Two kinds of limitations must be recognized: (1) limitations of the model based on the non-complete nature of the data, and (2) limitations of the rules and characteristics used to sort projects into cost groups. The first kind refers to use of the model for costing a new project composed of a set of characteristics unlike any encountered in the data base. The second refers to the rule violators, projects which are sorted into one cost group on the basis of their descriptive characteristics and into another on the basis of their cost.

Rule violators are indicated in the sections of cost groups for each R&D category, but are not represented in the flow charts. Only fifty-four or approximately eight per cent of all projects sorted into cost groups on the basis of descriptive characteristics were rule violators.

The first limitation, and the more important, emphasizes the non-universality of the cost model. Projects containing new combinations of characteristics may fall into none of the cost groups by application of the flow chart. For example, included in the data base are surveys of approximately 1600 interviews and surveys of approximately 4000 interviews. Whether a new project

consisting of 3000 interviews would fall into one cost group or the other cannot be determined on the basis of the data which was used to develop the model. Quantitative interpolation or extrapolation may be valid in some cases such as surveys, but is not readily applicable in other more qualitative cases of project differences.

This limitation stresses the nature of the paper as providing guidelines, rather than answers. "Interpretive interpolation" will usually be required for any new project costing. However, these guidelines may be a useful way to provide a baseline cost for new projects from which adjustments may be made on the bases of individual variation from projects within the data base.

KEEPING THE MODEL UPDATED

The non-complete nature of the flow charts and the existence of rule violators emphasize the cost model as being a product of selectivity and interpretation. Furthermore, as experience with R&D programs and methodology grows, what requires a certain amount of resources at one time may require a different amount at another. In other words, what was once a cost discriminating characteristic of projects at one time may lose its discriminating powers as changes in R&D occur. Consequently, new cost discriminators must be found and new flow charts written for effective guidelines.

Additionally, as new projects are added to the data base, subsequent analyses may select a different and more discriminating set of project descriptors as the bases of cost estimating guidelines.

Revising the model on the basis of new data requires going through the same procedure as formulating the first model. This procedure is detailed in the following eight steps.

figure 1.

STEPS IN DEVELOPING OUTPUT-ORIENTED COST MODELS FOR EDUCATIONAL R&D PROJECTS

Step 1. (Output Categories)

Divide the total set of projects into separate categories on the basis of *kinds of output or products produced*, or *kinds of activities performed*.

e.g.

(1) Theoretical, analytical and experimental studies
focusing on:
literature review, analysis, experimentation, explanation.

(2) Surveys
focusing on:
attitude, opinion, characteristic or decision descriptors or a selected population.

(3) Program or product evaluations
focusing on:
assessment or impact on a selected population by a specified program or product.

(4) Developmental projects
focusing on:
construction of materials, curricula, measuring scales, techniques, or classroom or administrative procedures.

(5) Research training programs
focusing on:
structured training experiences in research for selected populations.

(6) Conferences, symposiums, and seminars
focusing on:
planned and structured forums for discussion and dissemination of preselected topics and ideas.

(7) Establishment (or continuation) of centers or national and regional laboratories
focusing on:
coordination of multiple, continual efforts toward an overall objective or in a specified area.

(8) Program or function facilitation projects
focusing on:
augmenting existing activities by providing either facilities expansion, services, teacher or leadership training, demonstration or dissemination activity, additional pilot program testing, or program planning and development.

figure 1. (cont.)

(9) [Residual category]

all projects ≤$10,000.

Step 2. (Category Cost Lists)

For each category, excluding residual, list the *project costs* in increasing order.

Step 3. (Cost Groups)

Look for natural divisions in the cost lists; *e.g.*, dividing project costs into *subgroups* of:

$10,000	-	$50,000 projects
$50,000	-	$150,000 projects
$150,000	-	$500,000 projects
$500,000	-	$1 M projects

Step 4. (Project Characteristic List)

Using the project descriptions, develop a first-cut list of *characteristics* which describe the projects in terms of

a) focus
b) level (preschool, elementary, high, college or post-high)
c) methodology

and other appropriate traits which may affect cost, and produce for each cost group a matrix of all projects described in terms of these characteristics. (See the Appendix for descriptions of the actual matrices used to develop this Report.)

Step 5. (Cost-Differentiating Characteristics)

Using both the matrix and the original project descriptions, try to determine what it is that makes projects in one cost group *different* from those in other cost groups.

e.g., In the category of the theoretical, analytical, and experimental studies, of those projects which employ laboratory methodologies, the projects which do not include designing and testing of new equipment tend to fall into the $10,000 - $50,000 cost group, while those projects which do include designing and testing of new equipment tend to fall into the $150,000-$500,000 cost group.

Step 6. (Revision of List of Differentiating Characteristics)

Continue to revise and search for differentiating characteristics so that each project in the output category can be assigned to either a single cost group or to a residual group in which project descriptions are too general to identify cost differentiators.

figure 1. (cont.)

Step 7. (Cost Group Summaries)

For each cost group in each output category, summarize the differentiating characteristics pertinent to it.

Step 8. (Project Sorter)

Construct a project-sorting flow chart for each output category which will sequentially apply questions referring to differentiating characteristics and thus sort projects into their cost group.

II. THEORETICAL, ANALYTICAL AND EXPERIMENTAL STUDIES

(A) Descriptive Characteristics:

1. Laboratory Experimentation. Emphasizes the application of controlled treatments, or division of subjects among groups by specified natural characteristics, for purposes of measuring treatment effect.
   "Laboratory" may mean room, course, school, or program setting.

2. Literature Search/Data Analysis. Emphasizes the analysis of material or data which has already been produced rather than the collection of new material.

3. Interviewing. Emphasizes collection of new data primarily by interview, structured or unstructured. Studies based solely on administration of questionnaires are not included, nor are general surveys unconcerned directly with explanation.

4. Design and Test/Equipment. Included in the study is the development and test of new hardware for purposes of experimentation.

5. Design and Test/Measures. Included in the study is the development and test of new measuring scales or models of measurement, or measuring tests.

6. Automatic Data Processing. At least part of the analysis to be performed will be done by computer.

7. National/International Data Base. The data base to be analyzed is to be collected from throughout the United States or among more than one country.

8. Supplementary New System Design. Included in the study are major efforts toward either system improvement or design of new systems.

9. Small Scale Interviewing. $\leq$1000 interviews.

10. Large Scale Interviewing. $>$1000 interviews.

11. Administration of Existing Tests. Included in the study is the administration of existing tests--of one or more standardized tests, psychological or physicological.

12. Longitudinal. The application of treatment, data base, or interviewing process extends throughout a program, course of study, or a year or more.

(B) Cost Groups:

A. $10,000-$50,000 Cost Group: (92)

1. Using laboratory experimentation (32)
   a. nonlongitudinal, and
   b. for which no new equipment or measuring scales are designed and tested.

   Primary focus is on perceptual motor skills and learning procedures.

2. Using literature search and/or Data analysis (48)
   a. involving no automatic data processing
   b. no nationwide data base, and
   c. no accompanying efforts toward system redesign or improvements.

3. Using very small scale interviewing (a few hundred or less). (8)

4. Rule violators. (4)

B. $50,000-$150,000 Cost Group: (57)

1. Using laboratory experimentation (20)
   a. for which no new equipment is designed and tested, and
   b. involving either
      (1) designing and testing new measuring scales or tests
      (2) longitudinal application of treatment.

2. Using literature search and/or data analysis including (26)
   a. only automatic data processing, or
   b. only a national data base, or
   c. only supplementary efforts toward system design or imporvements, or
   d. only supplementary interviewing.

   Primary focus is on organization efficiency.

3. Rule violators (11)

C. $150,00-$500,00 Cost Group: (29)

1. Using laboratory experimentation for which new equipment is designed and tested. (3)
   Primary focus is on perceptural-motor skills and learning procedures.

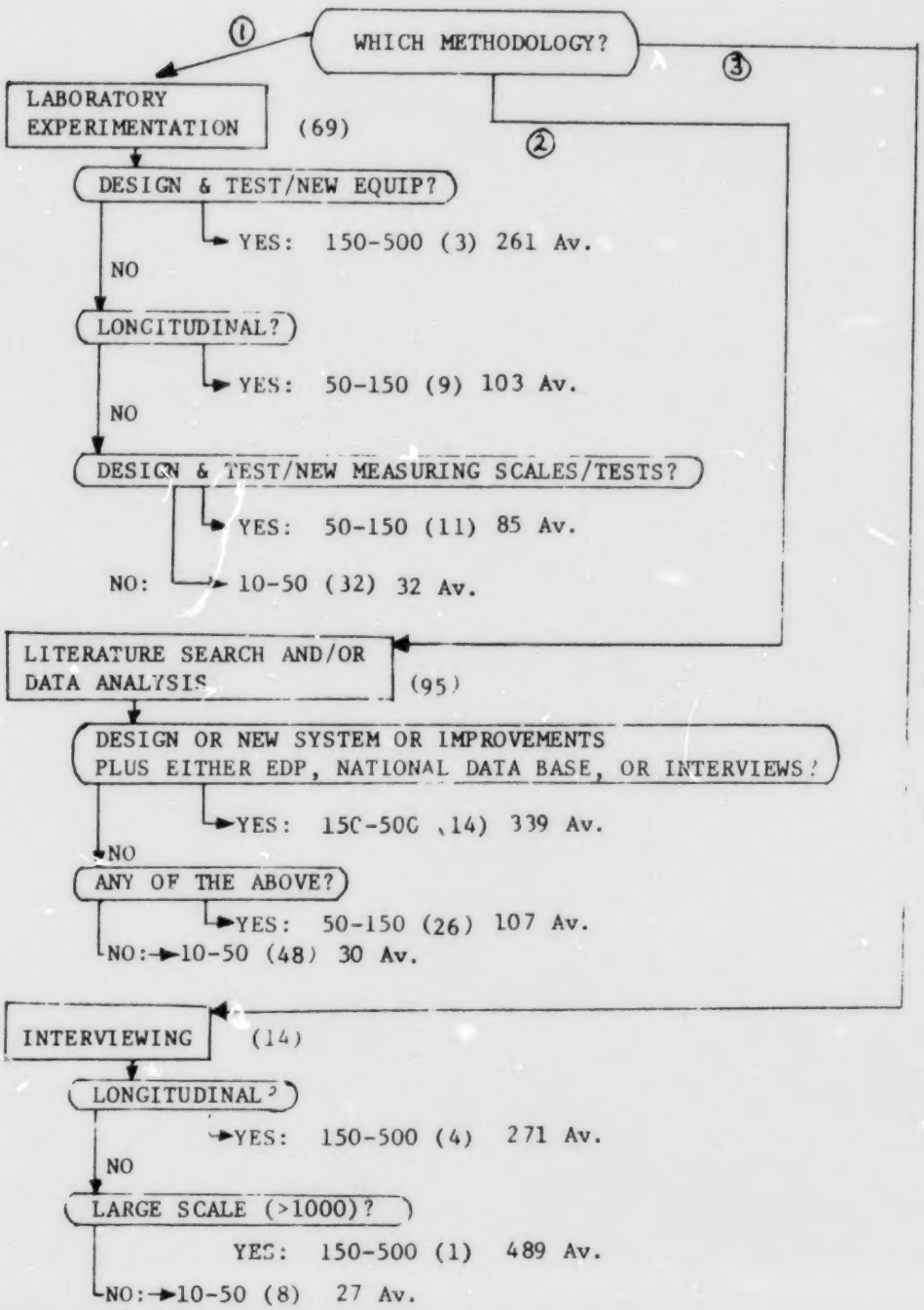
2. Using literature search and/or data analysis (14) in which supplementary new system design or improvement is combined with either
   a. automatic data processing, or
   b. national data base, or
   c. supplementary interviewing.

3. Using interviewing: (5)
   either a. longitudinally, or
   b. large samples (>1000).

4. Rule violators (7)

figure 2.

FLOW CHART FOR COSTING
THEORETICAL, ANALYTICAL AND EXPERIMENTAL STUDIES (178)



Number in () = number of projects which fell into that cost group or category. Cost groups stated in thousands of dollars. Rule violators are not represented.

III. SURVEYS

(A) Descriptive Characteristics:

1. Very Small Scale.

   Less than 300 interviews, or
   less than 3000 questionnaires, or
   3 countries surveyed.

2. Small Scale.

   1600 interviews, or
   8000 questionnaires.

3. Medium Scale.

   4000 interviews, or
   12,000 questionnaires, or
   6 countries surveyed.

4. Large Scale.

   9000 interviews, or
   19 countries surveyed.

5. Very Large Scale.

   130,000 interviews.

6. Supplementary New System Design.

   Included in the study are efforts toward either system improvements or development of models.

(B) Cost Groups:

A. $10,000-$50,000 Cost Group: (6)

1. Very small scale
2. No longitudinal data collection
3. No dissemination efforts
4. No supplementary new system design

B. $50,000-$150,000 Cost Group: (6)

1. Small scale
2. Some dissemination efforts

or 3. Efforts toward system or model design

C. $150,000-$500,000 Cost Group: (9)

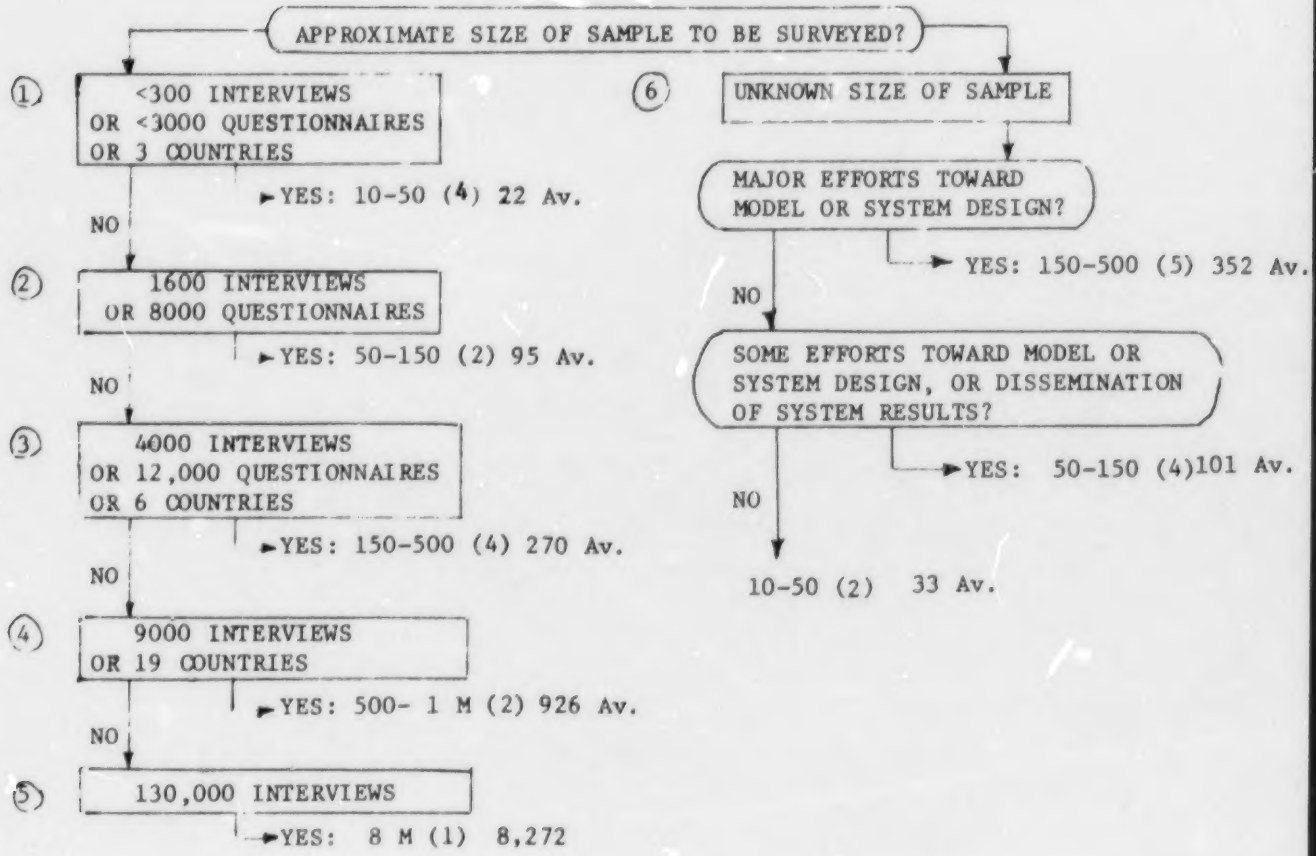
1. Medium scale
2. Major efforts toward system or model design

D. Large and Very Large Cost Group: (3)

1. Large scale ($782,000, $1,069,000)
2. Very large scale ($8,272,000)

figure 3.

FLOW CHART FOR COSTING SURVEYS (24)



Number in () = number of projects which fell into that cost group or category. Cost groups stated in thousands of dollars (or M = millions of dollars). Rule violators are not represented.

IV. PROGRAM OR PRODUCT EVALUATIONS

(A) Descriptive Characterisitcs:

1. Small Scale.
   300 interviews
   2000 questionnaries

2. Large Scale.
   30,000-35,000 questionnaires

3. Few Variables Only.
   Evaluation is directed toward specified few measures such as cost, difference in student achievement, acceptability.

4. Overall Evaluation.
   Complete assessment of the program or product.

5. Developments for Improvement.
   Inclusion of new system design, pilot versions of new programs or products, or recommendations for improvement.

(B) Cost Groups:

A. $10,000-$50,000 Cost Group: (8)
   1. Examination of effect on a few variables only using either
      (a) laboratory experimentation or
      (b) analysis of existing data, (4)

   or 2. Overall evaluation of program or product by small scale evaluation efforts. (4)

   3. In all cases: no developments for improvement.

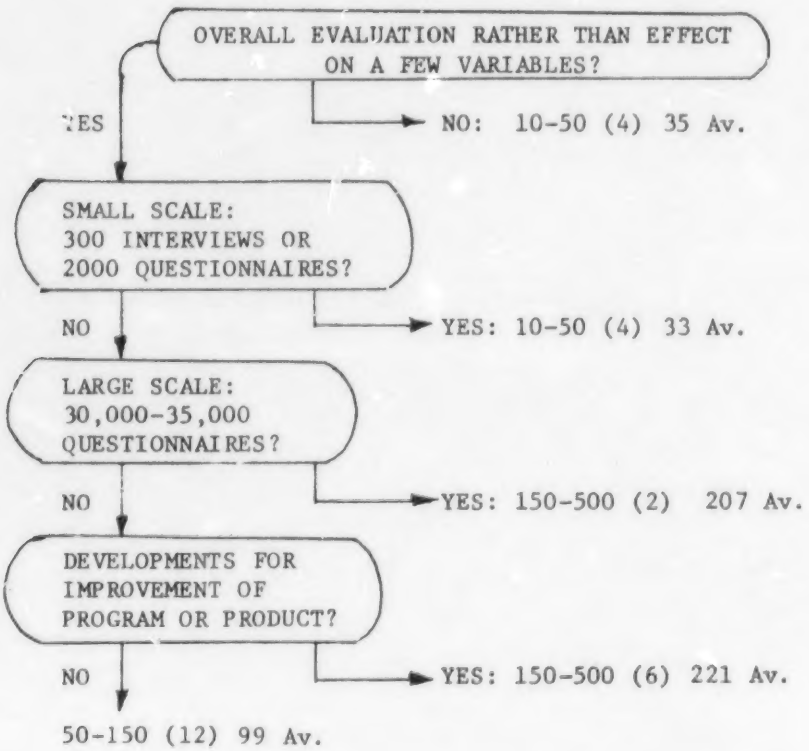
B. $50,000-$150,000 Cost Group: (15)
   1. Overall evaluation by methods including analysis of existing data. (12)

   2. In all cases: no developments for improvement.
   3. Rule violators (3)

C. $150,000-$500,00 Cost Group: (10)
   1. Overall evaluation of program or product by large scale evaluation efforts, (2)
   or 2. Inclusion of developments for improvement. (6)
   3. Rule violators (2)

figure 4.

FLOW CHART FOR COSTING PROGRAM OR PRODUCT EVALUATIONS (33)


OVERALL EVALUATION RATHER THAN EFFECT ON A FEW VARIABLES?
NO: 10-50 (4) 35 Av.
YES
SMALL SCALE: 300 INTERVIEWS OR 2000 QUESTIONNAIRES?
YES: 10-50 (4) 33 Av.
NO
LARGE SCALE: 30,000-35,000 QUESTIONNAIRES?
YES: 150-500 (2) 207 Av.
NO
DEVELOPMENTS FOR IMPROVEMENT OF PROGRAM OR PRODUCT?
YES: 150-500 (6) 221 Av.
NO
50-150 (12) 99 Av.

Number in () = number of projects which fell into that cost group or category. Cost groups stated in thousands of dollars. Rule violators are not represented.

V. DEVELOPMENT PROJECTS FOR CURRICULA OR MATERIALS

(A) Development Categories:

Development projects include such a wide variety of activity that it is first necessary to separate the total set of projects into sub-objective categories before searching for cost differentiating characteristics. (This separates the apples from the oranges before examining size as a function of fertilizers.) In this study, development projects are classified according to the following sub-objectives:

Development Categories

I. Subject Matter (Content) Only.

- A. Materials only, e.g., texts, films
- B. Curricula for a single course
- C. Curricula for a single field, e.g., mathematics or social studies
- D. Total curriculum, e.g., entire high school curriculum

II. Classroom Operations (Pedagogy or Testing) Only

III. Subject Matter Plus Classroom Operations

- A. For a single course
- B. For a single field
- C. For a total curriculum

IV. Administrative Techniques/Procedures

- A. With computerized systems
- B. Without computerized systems

(B) Descriptive Characteristics:

1. Subject Matter Only

Directed toward the development of *materials* or *curricula* to be used by students in the classroom. These projects are oriented toward content only.

2. Classroom Operations Only.

Directed toward the development of *teaching or testing procedures* or techniques, cooperative *classroom arrangements*, or materials for either, which affect the teacher-student interaction. These projects are oriented primarily toward the teaching process.

3. Subject Matter Plus Classroom Operations

Directed toward the development of *both* materials of content and procedures or arrangements for classroom operations.

4. Administrative Techniques or Procedures.

Directed toward the development of analytic tools or procedures for school management or organization, or for student counseling.

5. Materials Only

Including textbooks, workbooks, manuals, TV shows, films, audio tapes, displays, games, computer programs, laboratory equipment, and analytical or simulation models.

6. Curricula for a Single Course.

Projects directed toward the development of a single specified course, whether one semester or one year.

7. Curricula for a Single Field or Course of Study.

Projects directed toward the development of a single field of knowledge such as physics, mathematics, electrical engineering, agricultural vocation, and involving more than one course.

8. Total Curricula.

Projects directed toward the development of an entire curriculum covering all relevant fields.

9. Evaluation Included.

Projects which include stated efforts toward the evaluation of materials, curricula, or procedures developed.

10. Training Included.

Projects which include stated efforts toward the training of teachers or equipment users in the application of the the product or procedure developed.

11. Dissemination Effort Included.

Projects which include stated efforts toward dissemination of project results.

12. Surveys/Conferences.

Projects which include planned seminars, workshops, or conferences as part of the development activity, or which include interview or other survey techniques for planning or evaluation.

13. Generalized.

Development projects purposely directed toward widespread or general application.

14. Targeted.

Projects which are directed toward only one or a few schools, districts, organizations, or applications.

(C) Cost Groups for the Different Categories.

Category		Data Pages
A	Subject Matter - Materials	1-2
B	Subject Matter - Single Course	3
C	Subject Matter - Single Field	4-5
D	Subject Matter - Total Curriculum	6
E	Classroom Operations	7
F	S.M. Plus C.O. - Single Course	8
G	S.M. Plus C.O. - Single Field	9-11
H	S.M. Plus C.O. - Total Curriculum	12-14
I	Adm. Tech/Proc. - With Computer System	15
J	Adm. Tech./Proc. - Without Computer System	16-18

Category A: Subject Matter - Materials Only (16)

$10,000 - $100,000 Cost Group: (8)

1. Projects targeted toward one or a few schools
or 2. Generalized projects which do not include development of any manuals or guides
3. In all cases: No training, textbooks, workbooks, films, or computer programs/systems

$100,000 - $200,000 Cost Group: (4)

1. Generalized projects, including the development of manuals, texts, or films and audio presentations
2. In all cases: No evaluation, training, or dissemination efforts are included in the project statement

$200,000 - $500,000 Cost Group: (3)

1. Generalized projects which do include evaluation or training in their statement
2. Projects including the development of: films and audio presentations, or computer systems and associated manuals/guides, or texts.

$ Larger ($550,000): (1)

1. Generalized projects which include the development of a combination text and computer system

Category B: Subject Matter - Single Course: (6)

$10,000 - $100,000 Cost Group: (4)

1. Generalized projects which include either evaluation, or the development of films and audio presentations
2. In all cases: No dissemination, or training
3. In all cases: At the elementary or college level

$160,000 - $260,000 Cost Group: (2)

1. Generalized projects involving the development of a combination of test instrument, audio presentation, workbook, and manual.

or 2. Generalized projects including the development and dissemination of a textbook.

3. In all cases: At the high school level

Category C: Subject Matter - Single Field: (18)

$60,000 - $100,000 Cost Group: (3)

1. Generalized projects including no evaluation, training, dissemination, or surveys/conferences
2. In all cases: At the elementary or high school level.

$100,000 - $200,000 Cost Group: (5)

1. Manuals/Guides for targeted efforts only
2. Evaluation or surveys/conferences included
3. At any of the school levels

$200,000 - $400,000 Cost Group: (7)

1. All generalized projects at the elementary or high school levels.
2. Including evaluation and/or manuals/guides; some projects include teacher training, dissemination, and surveys/conferences.
3. Rule violators (3)

High Cost Projects (Over $1,000,000): (3)

1. Generalized projects at the high school or college levels.
2. Including evaluation plus either training, dissemination surveys/conferences, or combinations thereof

Category D: Subject Matter-Total Curriculum: (2)

Lost Cost ($250,000): (1)

1. Projects including the development of testing or measuring techniques which are targeted toward one or a few schools or only a specific application, and which include evaluation and training

High Cost ($5,325,000): (1)

1. TV for preschoolers, directed toward general application.

Category E: Classroom Operations: (12)

$10,000 - $100,000 Cost Group: (7)

1. Generalized projects, some which include computer systems (CIA) or application of multimedia techniques.
2. In all cases: No training, or major dissemination efforts.

$100,000 - $140,000 Cost Group: (3)

1. Generalized projects, some which include films and classroom simulations.
2. In all cases: Projects include either training or dissemination activities.

$200,000 - $300,000 Cost Group: (2)

1. Projects including the development of both computer systems and testing/measuring instruments.

Category F: Subject Matter Plus Classroom Operations - Single Course: (4)

Low Cost ($84,000): (1)

1. Projects which include the development of films and audio presentations, plus evaluation and training.

Medium Cost ($645,000): (1)

1. Projects of a multimedia emphasis, which include evaluation and which are targeted toward a specific application

High Cost (Approximately $1,250,000): (2)

1. Projects of a multimedia emphasis which include development of a computer system and project evaluation, and which are targeted toward a specific application.

Category G: Subject Matter Plus Classroom Operations - Single Field: (23) plus 2 rule violators of low cost.

$200,000 - $800,000 Cost Group: (21)

1. Projects at any education level and in any field.
2. Most include evaluations, and some include training, dissemination, or surveys/conferences.
3. In all cases: No computer systems or multimedia project development.

High Cost (Approximately $2,000,000): (2)

1. Generalized projects which include computer systems and the development of tests or measures, plus evaluation,

or 2. Multimedia projects which include evaluation, training, dissemination, and surveys/conferences.

Category H: Subject Matter Plus Classroom Operations - Total Curriculum: (24)

$20,000 - $70,000 Cost Group: (20)

1. In all cases, projects are targeted for single school districts, and at the high school level, with one exception at the elementary level; most projects include evaluation, some include training.
2. In all cases: No dissemination activity and no test/measure development.

$300,000 - $350,000 Cost Group: (3)

1. Projects which include either targeted test/measure development, or development of a Ph.D program, or which also focus on administrative procedures for school management.
2. In all cases: No training, dissemination, or surveys/conferences.

High Cost ($1,165,000): (1)

1. Development of a 2 year college program, with associated evaluation and survey/conference activity.

Category I: Administrative Techniques/Procedures - With Computer Systems: (9)

Under $1,000,000 Cost Group: (6)

1. Projects with evaluation, training, or dissemination

Over $1,000,000 Cost Group: (3)

1. Projects which also include development of subject matter for a course of instruction, plus evaluation.
or 2. Projects which include TV displays associated with the computer system, and evaluation plus dissemination
or 3. Projects which include all of: Training, disseminiation, and survey/conferences

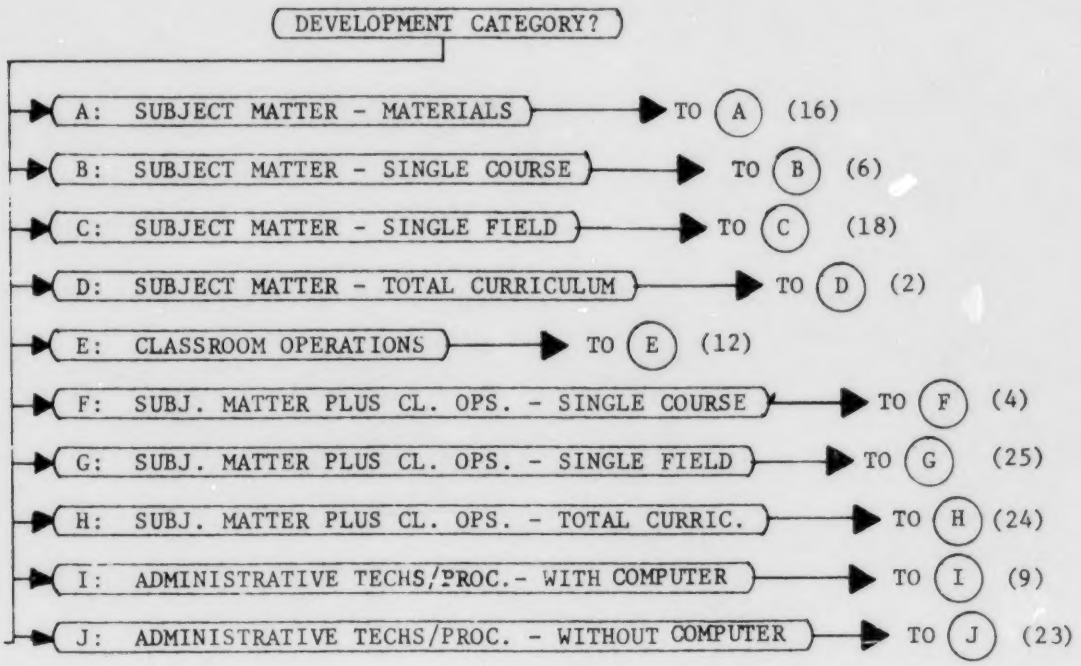
Category J: Administrative Techniques/Procedures Without Computer Systems: (23)

Predominantly undifferentiable projects between $20,000 and $500,00. However, projects which are generalized, and which include the development of tests/measures with accompanying manuals/guides, cluster between $100,000 and $150,000

All but two projects include development of manuals/guides. Some include evaluations, but only one includes training.

figure 5.

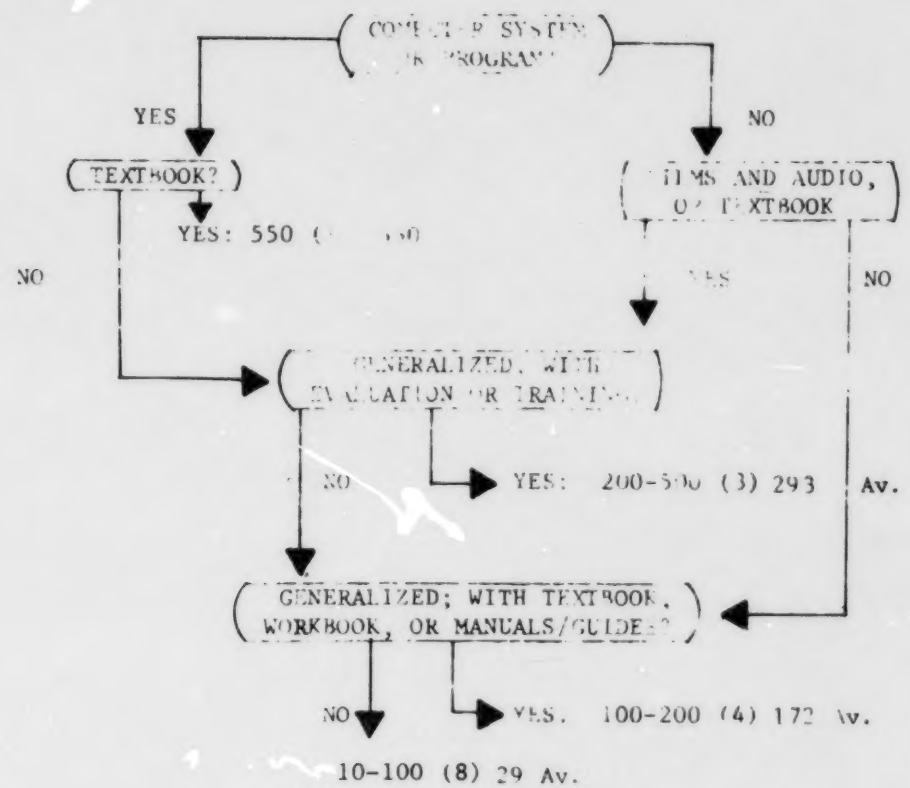
FLOW CHART FOR COSTING DEVELOPMENT PROJECTS (139)


DEVELOPMENT CATEGORY?
A: SUBJECT MATTER - MATERIALS
TO A (16)
B: SUBJECT MATTER - SINGLE COURSE
TO B (6)
C: SUBJECT MATTER - SINGLE FIELD
TO C (18)
D: SUBJECT MATTER - TOTAL CURRICULUM
TO D (2)
E: CLASSROOM OPERATIONS
TO E (12)
F: SUBJ. MATTER PLUS CL. OPS. - SINGLE COURSE
TO F (4)
G: SUBJ. MATTER PLUS CL. OPS. - SINGLE FIELD
TO G (25)
H: SUBJ. MATTER PLUS CL. OPS. - TOTAL CURRIC.
TO H (24)
I: ADMINISTRATIVE TECHS/PROC.- WITH COMPUTER
TO I (9)
J: ADMINISTRATIVE TECHS/PROC. - WITHOUT COMPUTER
TO J (23)

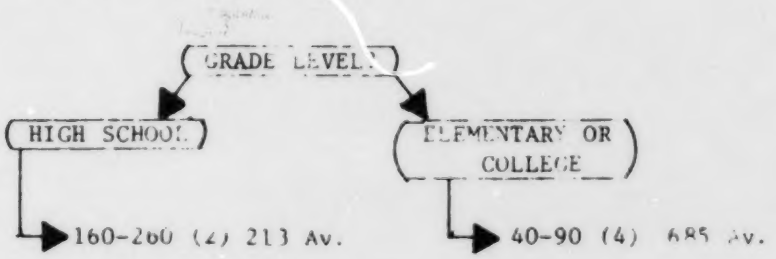
BEST COPY AVAILABLE

Figure . (cont.)

(A) : SUBJECT MATTER - MATERIALS ONLY (16)



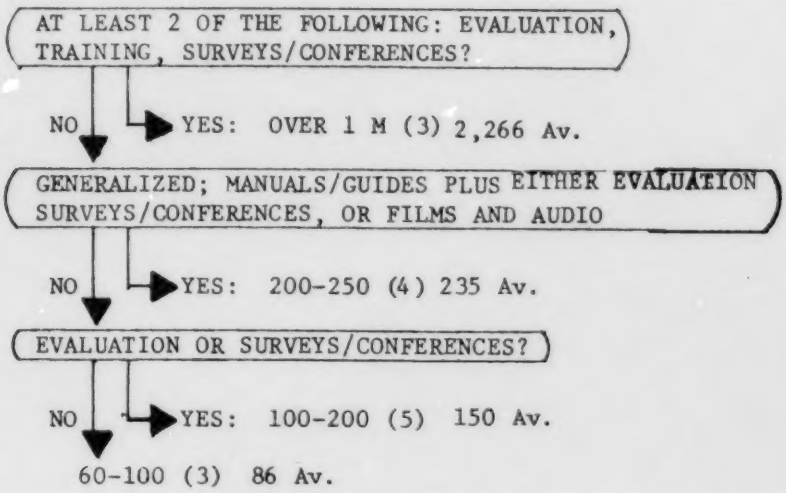
(B) : SUBJECT MATTER - SINGLE COURSE (6)



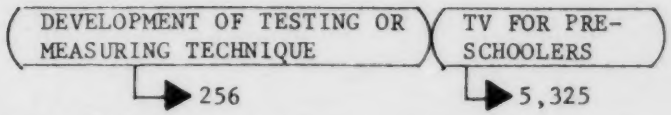
Number in () = number of projects which fell into that cost group or category. Cost groups stated in thousands of dollars. Rule violators are not represented.

figure 5. (cont.)

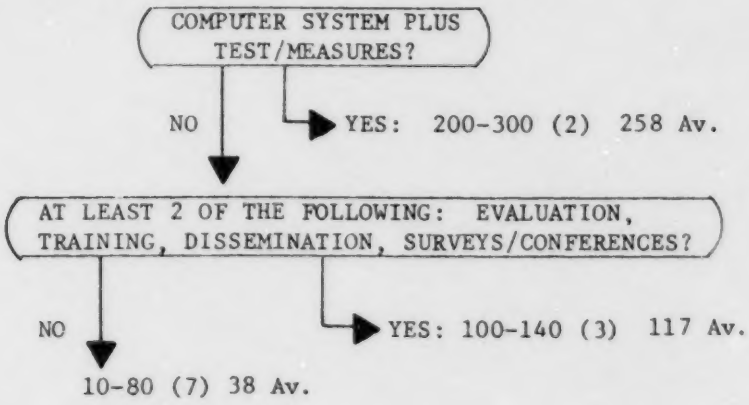
(C) : SUBJECT MATTER - SINGLE FIELD


AT LEAST 2 OF THE FOLLOWING: EVALUATION, TRAINING, SURVEYS/CONFERENCES?
NO
YES: OVER 1 M (3) 2,266 Av.
GENERALIZED; MANUALS/GUIDES PLUS EITHER EVALUATION SURVEYS/CONFERENCES, OR FILMS AND AUDIO
NO
YES: 200-250 (4) 235 Av.
EVALUATION OR SURVEYS/CONFERENCES?
NO
YES: 100-200 (5) 150 Av.
60-100 (3) 86 Av.

(D) : SUBJECT MATTER - TOTAL CURRICULUM (2)



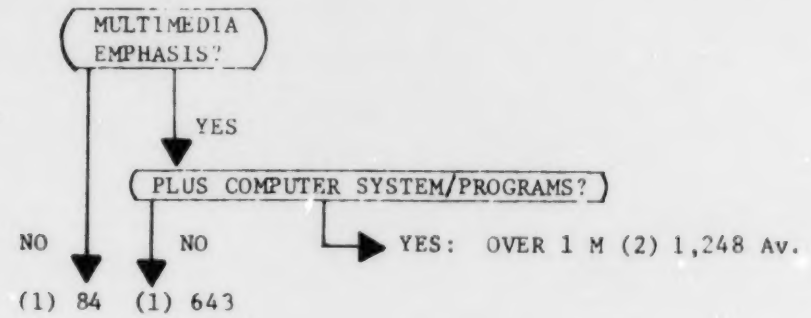
(E) : CLASSROOM OPERATIONS (12)


COMPUTER SYSTEM PLUS TEST/MEASURES?
NO
YES: 200-300 (2) 258 Av.
AT LEAST 2 OF THE FOLLOWING: EVALUATION, TRAINING, DISSEMINATION, SURVEYS/CONFERENCES?
NO
YES: 100-140 (3) 117 Av.
10-80 (7) 38 Av.

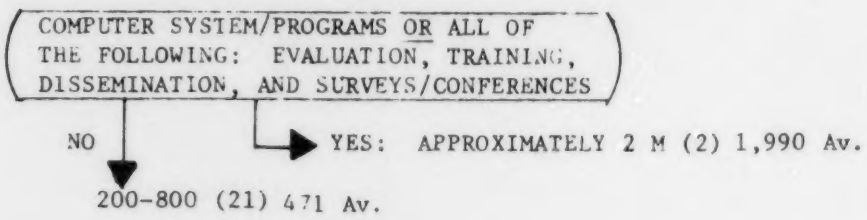
Number in () = number of projects which fell into that cost group or category. Cost groups stated in thousands of dollars. Rule violators are not represented.

figure 5. (cont.)

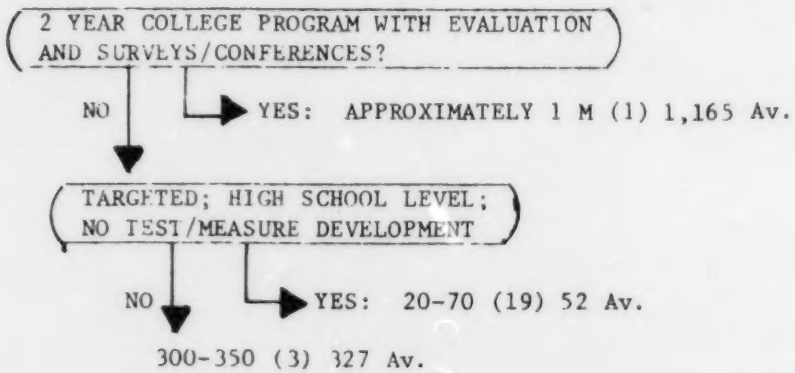
(F) : SUBJECT MATTER PLUS CLASSROOM OPERATIONS - SINGLE COURSE (4)



(G) : SUBJECT MATTER PLUS CLASSROOM OPERATIONS - SINGLE FIELD (25)


COMPUTER SYSTEM/PROGRAMS OR ALL OF THE FOLLOWING: EVALUATION, TRAINING, DISSEMINATION, AND SURVEYS/CONFERENCES
NO
YES: APPROXIMATELY 2 M (2) 1,990 Av.
200-800 (21) 471 Av.

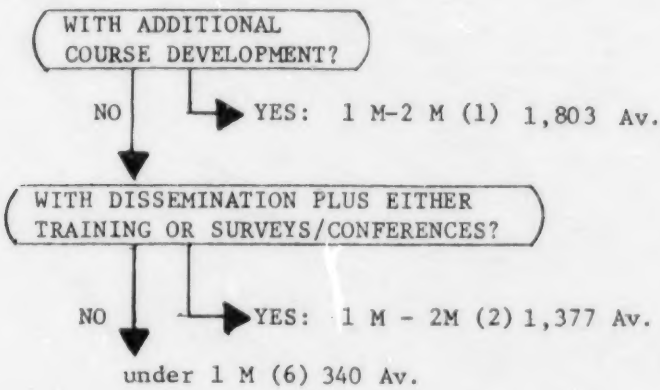
(H) : SUBJECT MATTER PLUS CLASSROOM OPERATIONS - TOTAL CURRICULUM (24)


2 YEAR COLLEGE PROGRAM WITH EVALUATION AND SURVEYS/CONFERENCES?
NO
YES: APPROXIMATELY 1 M (1) 1,165 Av.
TARGETED; HIGH SCHOOL LEVEL; NO TEST/MEASURE DEVELOPMENT
NO
YES: 20-70 (19) 52 Av.
300-350 (3) 327 Av.

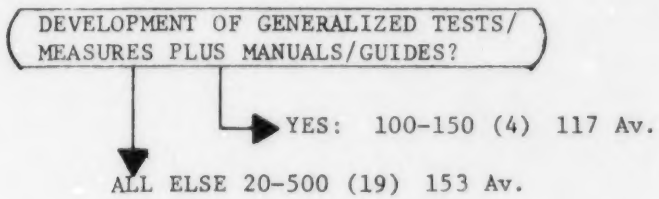
Number in () = number of projects which fell into that cost group or category. Cost groups stated in thousands of dollars (or M = millions of dollars). Rule violators are not represented.

figure 5. (cont.)

(I) : ADMINISTRATIVE TECHNIQUES/PROCEDURES - WITH COMPUTER SYSTEMS (9)


WITH ADDITIONAL COURSE DEVELOPMENT?
NO
YES: 1 M-2 M (1) 1,803 Av.
WITH DISSEMINATION PLUS EITHER TRAINING OR SURVEYS/CONFERENCES?
NO
YES: 1 M - 2M (2) 1,377 Av.
under 1 M (6) 340 Av.

(J) : ADMINISTRATIVE TECHNIQUES/PROCEDURES - WITHOUT COMPUTER SYSTEMS (23)



Number in () = number of projects which fell into that cost group or category. Cost groups stated in thousands of dollars (or M = millions of dollars). Rule violators are not represented.

VI. TRAINING PROGRAMS IN EDUCATIONAL RESEARCH

(A) Descriptive Characteristics:

1. Ph.D. Program. A training program which itself leads toward the doctoral degree, rather than a program supplement to existing degree programs in other fields.

2. Masters Program. Same as above except leading to the masters degree.

3. Postdoctoral Fellowship Program. Support for a single participant in an intensive program of educational research.

4. Field/Target Specific. A training program directed toward either a specified field of educational research, a specified area of competency or position, or a specified geographical or institutional market.

5. Consortium Program. A training program involving the participation of more than one university, or cosponsored by a number of school districts or other educational institutions.

6. Field Link With District. A training program in which strong ties with specified school districts are utilized for internships and obtaining field experience.

7. Proposed Institutes. Training workshops or seminars under the overall direction of a proposed institute.

8. Preconference Training Sessions. Training sessions conducted prior to and in association with a major educational conference.

9. Small Scale. Degree or nondegree programs of at least two years in which the number of participants is between 6 and 34.

10. Large Scale. Degree or nondegree programs of at least two years in which the number of participants is between 40 and 60.

(B) Cost Groups:

A. $10,000 - $50,000 Cost Group: (44)

1. Postdoctoral fellowship programs. (33)
2. Three day to seven week long meetings involving 30 to 240 participants (9)

   a) usually field or target specific

   b) sometimes held as preconference training sessions

TRAINING PROGRAMS IN EDUCATIONAL RESEARCH

3. Small scale, nondegree programs of a nonconsortium nature lasting one year or less. (2)

B. $50,00 - $100,000 Cost Group: (4)

1. Consortium training programs, nondegree. (2)
2. Rule violators (2)

C. $100,000 - $500,000 Cost Group: (63)

1. Small scale, degree or nondegree programs, which are field/target specific (8-34 participants) (40)

2. Other small scale, degree or nondegree programs, which are not field/target specific (6-30 participants) (18)

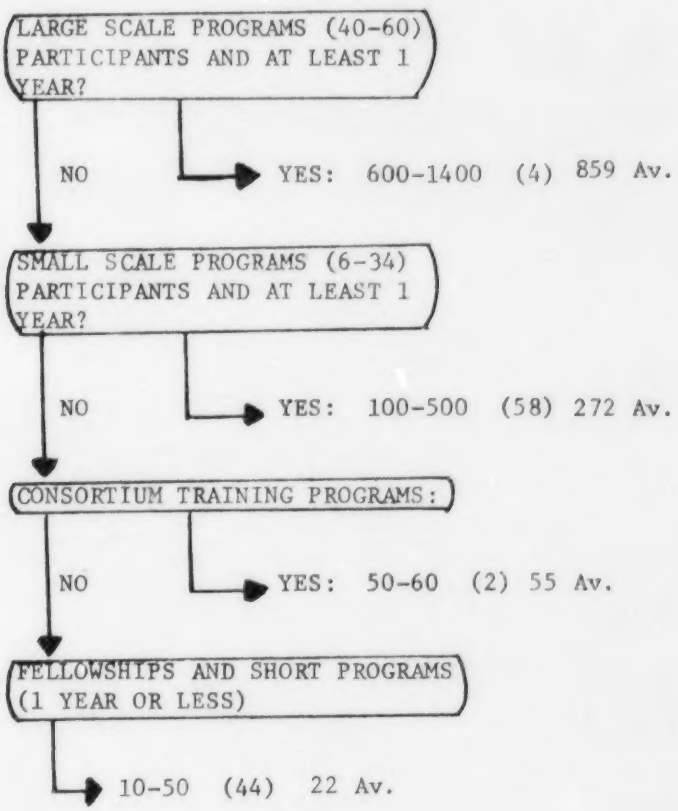
3. Rule violators (5)

D. Over $500,000 Cost Group: (4)

1. Large scale, degree or nondegree programs (40-60 participants) (4)

figure 6.

FLOW CHART FOR COSTING TRAINING PROGRAMS IN EDUCATIONAL RESEARCH (115)


LARGE SCALE PROGRAMS (40-60) PARTICIPANTS AND AT LEAST 1 YEAR?
NO
YES: 600-1400 (4) 859 Av.
SMALL SCALE PROGRAMS (6-34) PARTICIPANTS AND AT LEAST 1 YEAR?
NO
YES: 100-500 (58) 272 Av.
CONSORTIUM TRAINING PROGRAMS:
NO
YES: 50-60 (2) 55 Av.
FELLOWSHIPS AND SHORT PROGRAMS (1 YEAR OR LESS)
10-50 (44) 22 Av.

Number in () = number of projects which fell into that cost group or category. Cost groups stated in thousands of dollars. Rule violators are not represented.

VII. CONFERENCES, WORKSHOPS, SYMPOSIUMS, AND SEMINARS

(A) Descriptive Characteristics:

1. Writers of background papers. Indicates that content for the meeting has been prepared in advance by specified writers.

2. Analysis or actual plan development by attendees. Separates those meetings in which attendees listen and discuss, and those meetings during which attendees are expected to produce a plan or analysis related to the meeting topic.

3. Dissemination of results. Indicates a stated intent to publish or otherwise disseminate proceedings or results of the meetings.

(B) Cost Groups:

1. $12,000 - $40,000 Cost Group: (6)

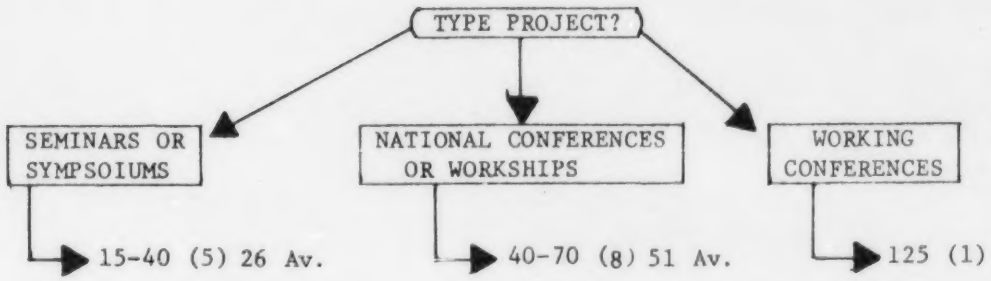
   Seminars and symposiums. (5)
   Rule violators (1)

2. $40,000 - $70,000 Cost Group: (8)
   National conferences or workshops without expected production of coherent plan or analysis by attendees.

3. $125,000 Cost Group: (1)
   Working Conferencesin which attendees are expected to produce a development plan, and for which 30 background papers are written.

figure 7.

FLOW CHART FOR COSTING CONFERENCES, WORKSHOPS, SYMPOSIUMS, AND SEMINARS (15)



Number in () = number of projects which fell into that cost group or category. Cost groups stated in thousands of dollars. Rule violators are not represented.

VIII. R&D CENTERS AND REGIONAL LABS

This section on R&D centers and laboratories represents a different cut through the funding of R&D by looking at past allocations of support to entire non-university instututions which then have discretionary powers as to which individual projects will be funded and administered. Unlike the other sections in this report which describe surveys, studies, and training programs in terms of their inherent cost-driving properties such as scale and specific activity, this section contains nothing which identifies characteristics which directly drive costs to specific levels. Rather, the analysis describes the relative amounts of funding which the Office of Education has itself decided to allocate to these institutions. Future decisions may show a different attitude in the funding of institutions such as centers and labs, for example, by providing less discretionary funding and encouraging more use of directly funded individual projects.

Costs of center or lab operation are listed in annual terms (full project cost divided by number of years of funding) in order to provide a more familiar basis to those administrators who deal with these operations. Again, I emphasize that these cost figures represent only past attitudes toward non-university institutional funding of R&D. There is nothing causal intended.

(A) Descriptive Characteristics:

1. ERIC Center. Establishing or continuing an educational resources information center.

2. Regional Lab. Establishing or continuing a major regional laboratory.

3. Preliminary Study. Indicates that the scope of the project covers only the planning or testing studies prior to the establishment of a proposed center or lab.

4. Center Operation. Indicates that the project includes the initial or continuing operation of center or lab for 1 to 5 years.

5. Stu es, Plans. Major focus on studies or planning activity.

6. Development of Instructional Materials. Component focus.

7. Development of Theories of Instruction or Learning. Component focus.

8. Teaching, Research, or Administrative Training. Component focus.

9. Student Training. Center activity in early child, student, or adult education.

10. Evaluation. Component focus.

11. Dissemination and Demonstration. Component focus.

12. Testing Programs. Focus on laboratory or field testing of center programs.

13. Management, Organization of Schools. Indicates a focus on the administrative and institutional arrangements of schools and districts.

14. Computer Assisted Instruction (CAI). Component focus.

15. T.V. Instruction. Component focus.

16. Computer Facility. Indicates a proposed system for providing computer services to the regional educational community.

17. Mass Media. Indicates center activity involving utilization of public broadcasting or other public media.

18. Production Capacity. Indicates proposed center capability for producing materials, displays, games, and other educational tools and products.

(B) Cost Groups:

A. $30,000 - $130,000 Annual Cost Group: (17) plus 1 rule violater

1. ERIC centers focused on minor educational areas such as testing and measurement, foreign languages, and library sciences. ($44,000 - $130,000) (5)

2. Preliminary studies and center operations (12) which include:

a. no development of materials
b. no development of theories of learning or instruction
c. no major evaluation
d. no focus on the management or organization of shcools
e. no CAI, TV instruction, or production capabilities

B. $130,000 - $260,000 Annual Cost Group: (15) plus 1 rule violator

ERIC centers focused on major educational areas such as higher education, vocational education, teacher education, educational technology, English, reading, and junior colleges.

C. $400,000 - $1,400,000 Annual Cost Group: (28)

1. Labs for regional areas of minor population concentration such as South-Central, Michigan-Ohio, Southeastern, and Appalachian. ($87,000 - $1,153,000). (13)

2. Preliminary studies or center operations (11) which do include either:

   a. development of materials
   b. development of theories of learning or instruction
   c. major evaluations
   d. focus on the management or organization of schools
   e. CAI, TV, or production capabilities

3. Rule violators (4).

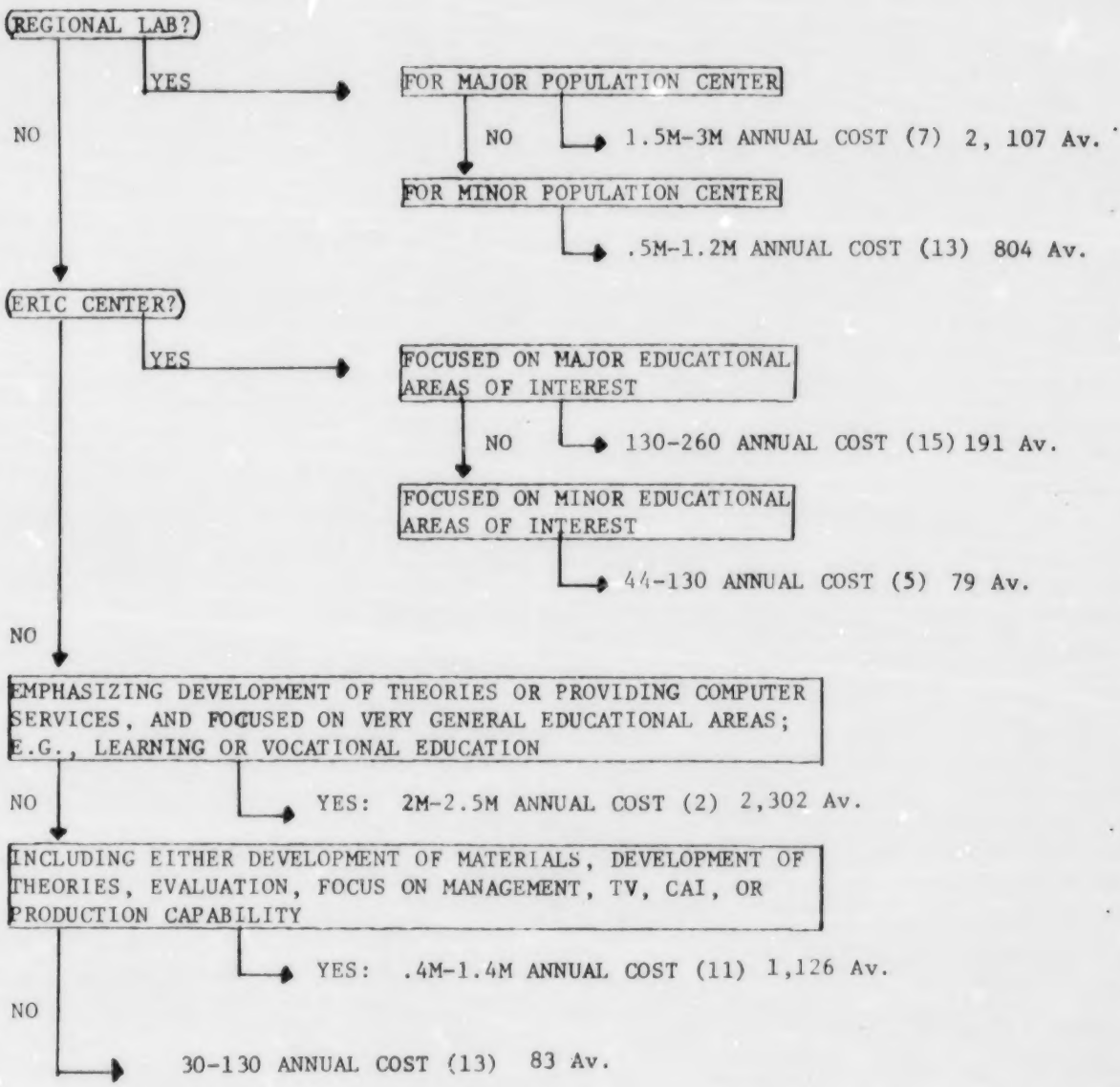
D. $1,500,000 - $3,000,000 Annual Cost Group: (9)

1. Labs for regional areas of major population concentration such as Far West, Central-Midwestern, and Metropolitan New York, and which may include activity in CAI, provision of computer facilities to its region, and production capabilities. (7)

2. Center operations which include development of theories or computer services, and which focus on very general educational areas, such as learning or vocational education. (2)

figure 8.

FLOW CHART FOR COSTING R&D CENTERS AND REGIONAL LABS (71)


REGIONAL LAB?
YES
NO
FOR MAJOR POPULATION CENTER
NO
1.5M-3M ANNUAL COST (7) 2, 107 Av.
FOR MINOR POPULATION CENTER
.5M-1.2M ANNUAL COST (13) 804 Av.
ERIC CENTER?
YES
NO
FOCUSED ON MAJOR EDUCATIONAL AREAS OF INTEREST
NO
130-260 ANNUAL COST (15) 191 Av.
FOCUSED ON MINOR EDUCATIONAL AREAS OF INTEREST
44-130 ANNUAL COST (5) 79 Av.
NO
EMPHASIZING DEVELOPMENT OF THEORIES OR PROVIDING COMPUTER SERVICES, AND FOCUSED ON VERY GENERAL EDUCATIONAL AREAS; E.G., LEARNING OR VOCATIONAL EDUCATION
NO
YES: 2M-2.5M ANNUAL COST (2) 2,302 Av.
INCLUDING EITHER DEVELOPMENT OF MATERIALS, DEVELOPMENT OF THEORIES, EVALUATION, FOCUS ON MANAGEMENT, TV, CAI, OR PRODUCTION CAPABILITY
YES: .4M-1.4M ANNUAL COST (11) 1,126 Av.
NO
30-130 ANNUAL COST (13) 83 Av.

Number in () = number of projects which fell into that cost group or category. Cost groups stated in thousands of dollars (or M = millions of dollars). Rule violators are not represented.

IX. PROGRAM OF FUNCTION FACILITATION

These projects serve to improve, expand, develop, or help institute change in existing educational programs or operations. They either provide supplementary program activity, or facilitate ongoing educational functions such as teaching, program leadership, or evaluation.

Some aid in the training of personnel for these programs or functions through short-term institutes, workshops, seminars, forums, or conferences related to the programs. Others facilitate program implementation through program planning projects, demonstration or dissemination projects, or by establishing consortiums of colleges or universities for their mutual development of research capability. Finally, some projects facilitate program or function development by providing funds for facility expansion.

(A) Descriptive Characteristics:

1. Training Institute/Program. Short-term (5 days - 3 weeks) or longer term (6 weeks - 2 years) training programs related to teaching, evaluation, administrative or innovative leadership. These programs may be in the form of institutes, workshops, conferences, forums, or seminars.

2. Multiple Institutes. A project which includes the operation of more than one training institute.

3. Program Planning/Coordinating. A project whose main focus is the planning of, or coordinating of, a specific program or a specific educational function such as evaluation or dissemination of research information.

4. Demonstration/Dissemination. A project whose main focus is aiding in the implementation of an existing program by providing supplementary demonstration or dissemination activity.

5. Facility Expansion. Added staff, equipment, or space to any program, educational institution, or service activity.

6. Consortiums. Coordinated efforts among a number of colleges or universities toward either research development or teacher training.

(B) Cost Groups:

A. $10,000 - $50,000 Cost Group: (36)

1. Short term (5 days - 3 weeks) training institutes/programs. (16)
2. Program planning/coordinating projects, excluding large major planning efforts. (12)
3. Small staff increments (1-2) for facility expansion. (3)
4. In all cases: no consortium activity, space or equipment expansion, demonstration or dissemination projects, or multiple institutes.
5. Rule violators (5)

B. $50,000 - $100,000 Cost Group: (11)

1. Longer term (6 weeks - 2 years) training institutes/programs. (4)
2. Larger or longer planning/coordinating efforts. (1-2 years of about 10 men) (7)

C. $100,000 - $200,000 Cost Group: (25)

1. Consortiums of from 3-6 colleges or universities for research development (8)
2. Consortiums for teach training. (4)
3. Demonstration/dissemination projects. (6)
4. Facility expansion through additions of staff and/or equipment, but not space. (5)
5. Rule violators (1)

D. $200,000 - $500,000 Cost Group: (8)

1. Multiple training or planning institutes. (3)
2. Large consortium projects of approximately 20 colleges or universities for research development. (1)
3. Long term (2-3 years). (2)
4. Rule violators (2)

E. Over $500,000 Cost Group: (3)

1. Major facility expansion through added space and equipment. (3)

figure 9.

FLOW CHART FOR COSTING PROGRAM OR FUNCTION FACILITATION PROJECTS (83)

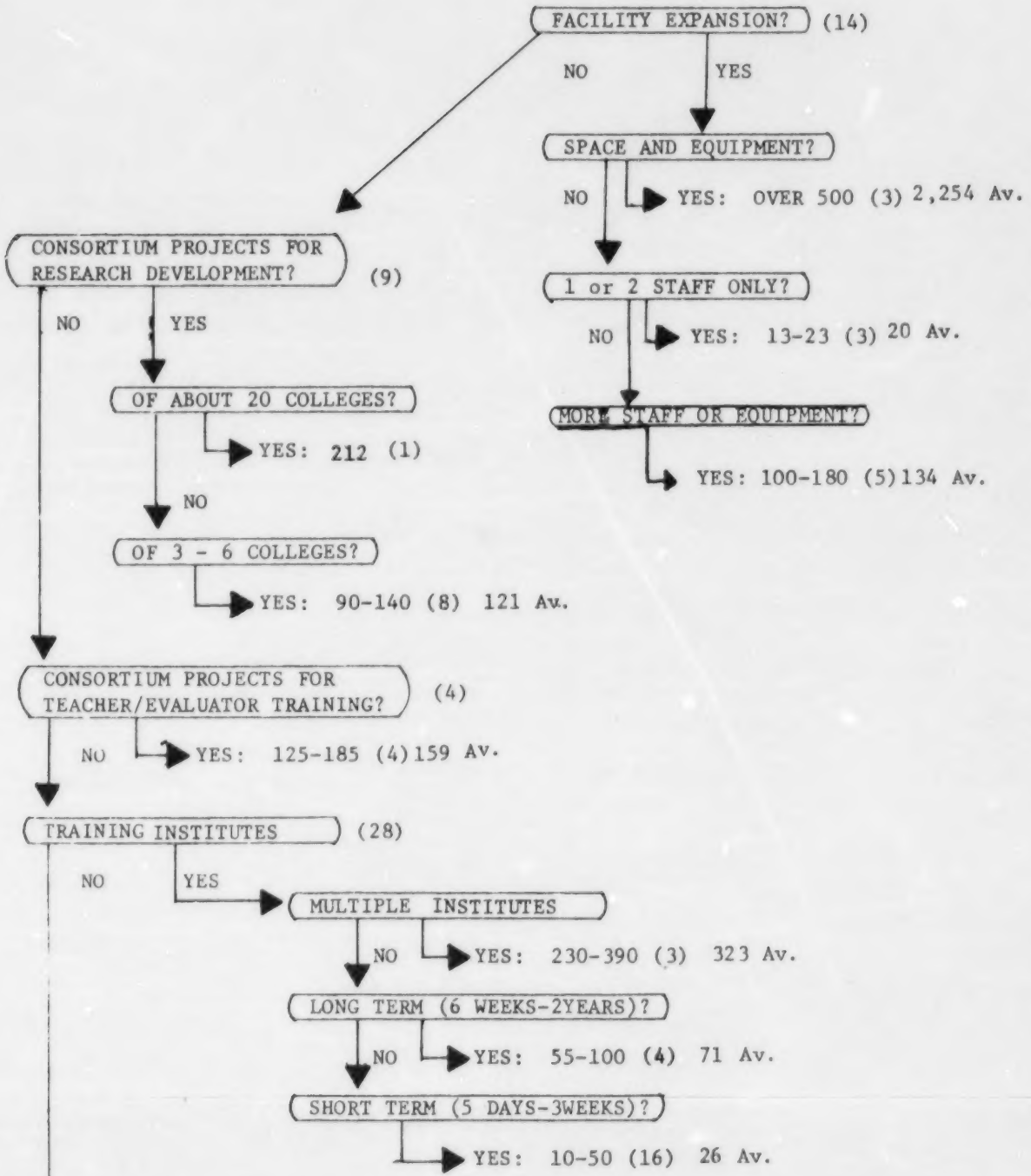
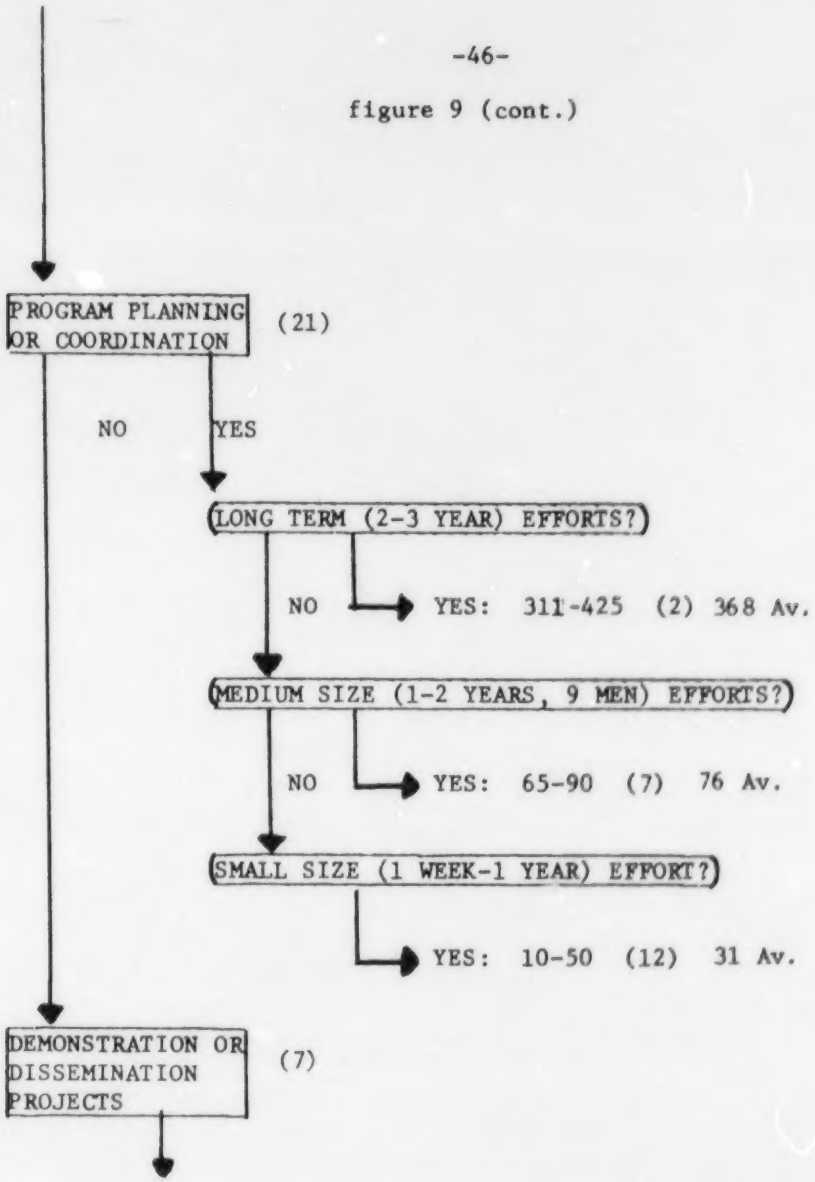


figure 9 (cont.)



Number in () = number of projects which fell into that cost group or category. Cost groups stated in thousands of dollars. Rule violators are not represented.

X. RESIDUAL CATEGORIES

The remaining projects fall into three residual categories.

1. Miscellaneous Projects Which Cost $10,000 or Less.
Of this set of residual projects, most are one year support for simple studies. The complete breakdown is:

a.	Theoretical, analytical, or experimental studies	288
b.	Surveys	8
c.	Development projects	80
d.	Product or program evaluations	28
e.	Research training programs	3
f.	Conferences, workshops, or seminars	5
g.	Centers or regional labs	0
h.	Program or function facilitation projects	5
Total miscellaneous projects costing $10,000 or less:		417

2. Miscellaneous Projects for Which No Cost Figure is Indicated

a.	Theoretical, analytical, or experimental studies	42
b.	Surveys	2
c.	Development projects	27
d.	Product or program evaluations	1
e.	Research training programs	8
f.	Conferences, workshops, or seminars	0
g.	Centers or regional labs	0
h.	Program of function facilitation projects	3
Total miscellaneous projects for which no cost is given:		83

3. Uncategorized Projects. These 57 miscellaneous projects are subject to any of the following situations:

   a. The title and paragraph description are sufficiently vague to prohibit categorization.

   b. The objective is sufficiently different from those eight categories outlined above to prohibit its placement in any one of them

   c. The paragraph description is not sufficiently informative to provide meaningful rationale as to why the project costs what it does.

   Project descriptions of these natures usually emphasize the necessity, desirability, and importance of the project or its resulting contributions, and in doing so, provide too little indication of the kind and scope of activities which will actually be carried out.

XI. NSF FUNDED EDUCATIONAL PROJECTS

Principal Curriculum Study Groups

In describing the Course Content Improvement Program of the Division of Pre-College Education in Science, NSF separates out twenty-six projects which it calls Principal Curriculum Study Groups. These are all curriculum development programs with the following descriptive characteristics:

1. They are directed toward mathematics, science, or both.
2. They cover the total field rather than a single course or materials only.
3. They cover a grade span of two years or more (up to 13 years).
4. All projects invlove some evaluation, teacher training, and dissemination activites.
5. All are generalized projects, to be use for wide application.

Unlike the projects funded by the Office of Education for development of curricula for a total field, these projects generally involve larger scope in grade span and larger dollar committments. This is shown in the following figure which compares the dollar distribution of curriculum development projects for a total field between Office of Education funded projects and NSF funded projects.

Because the Office of Education data base of this report contains only two relevant projects above one million dollars in cost, the twenty-six NSF Principal Curriculum Study Groups projects were not subjected to the cost rules developed on the basis of the Office of Education data. Instead, new cost rules are developed using this new data base. Cost groups for these NSF curriculum development projects are listed below:

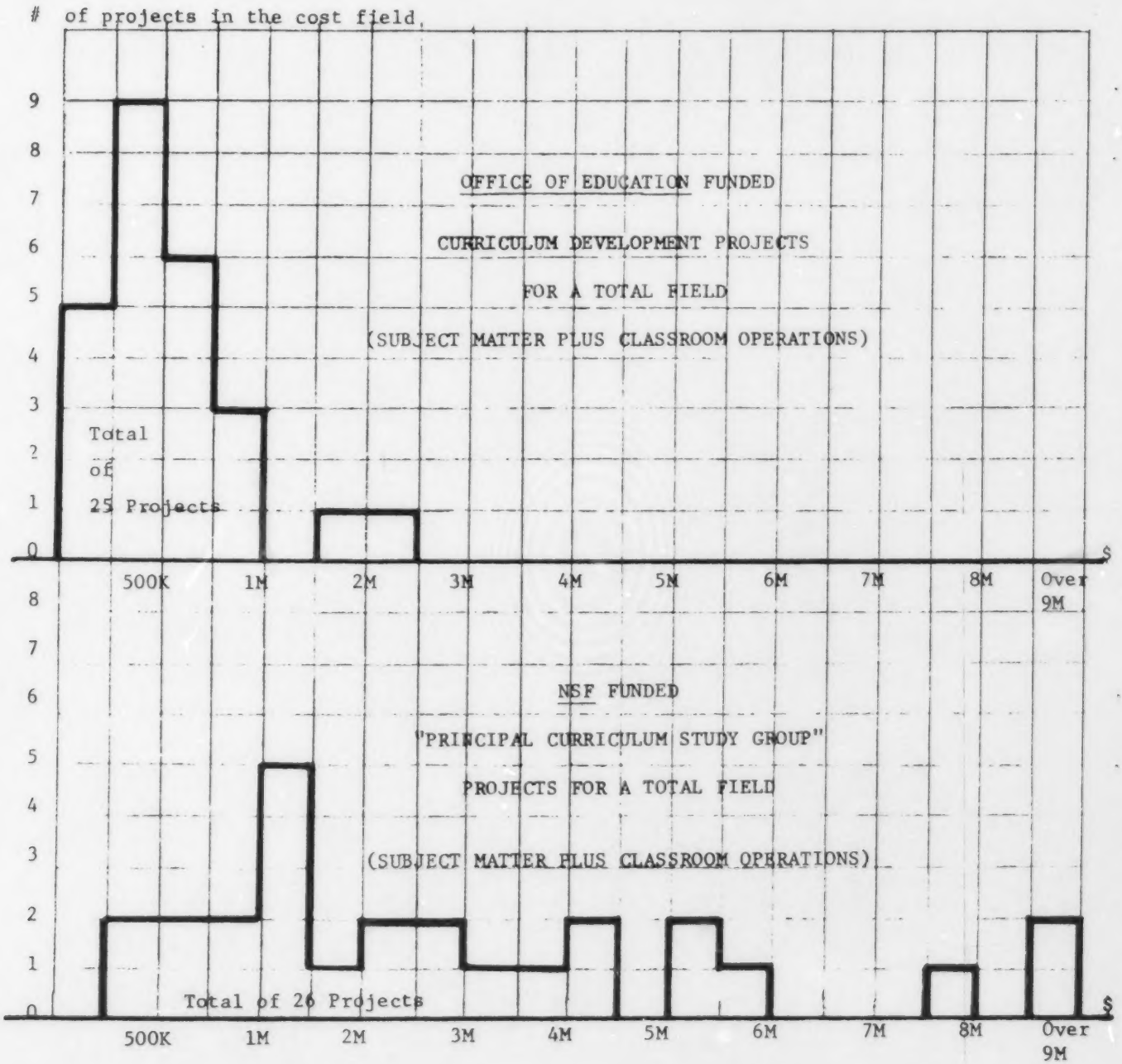
Cost Groups:

Under $1,000,000 Cost Group: (6)
1. Development of films; but not of texts (3)
2. Development of texts; and grade span of only 2 years (2)
3. Rule violators (1)

$1,000,000 to $2,000,000 Cost Group: (6)
Development of texts; grade span average of 3 years (6)

figure 10.

Comparison of the Dollar Distribution of
Curriculum Development Projects for a Total Field
Between Office of Education Funded Projects
and NSF Funded "Principal Curriculum Study Group" Projects



K=1,000

M=1,000,000

$2,000,000 to $5,000,000 Cost Group: (8)

Texts; grade span average of 4.75 years (8)

$5,000,000 to $10,000,000 Cost Group: (4)

1. Texts; grade span average of 5 years (3)
2. Rule violators (1)

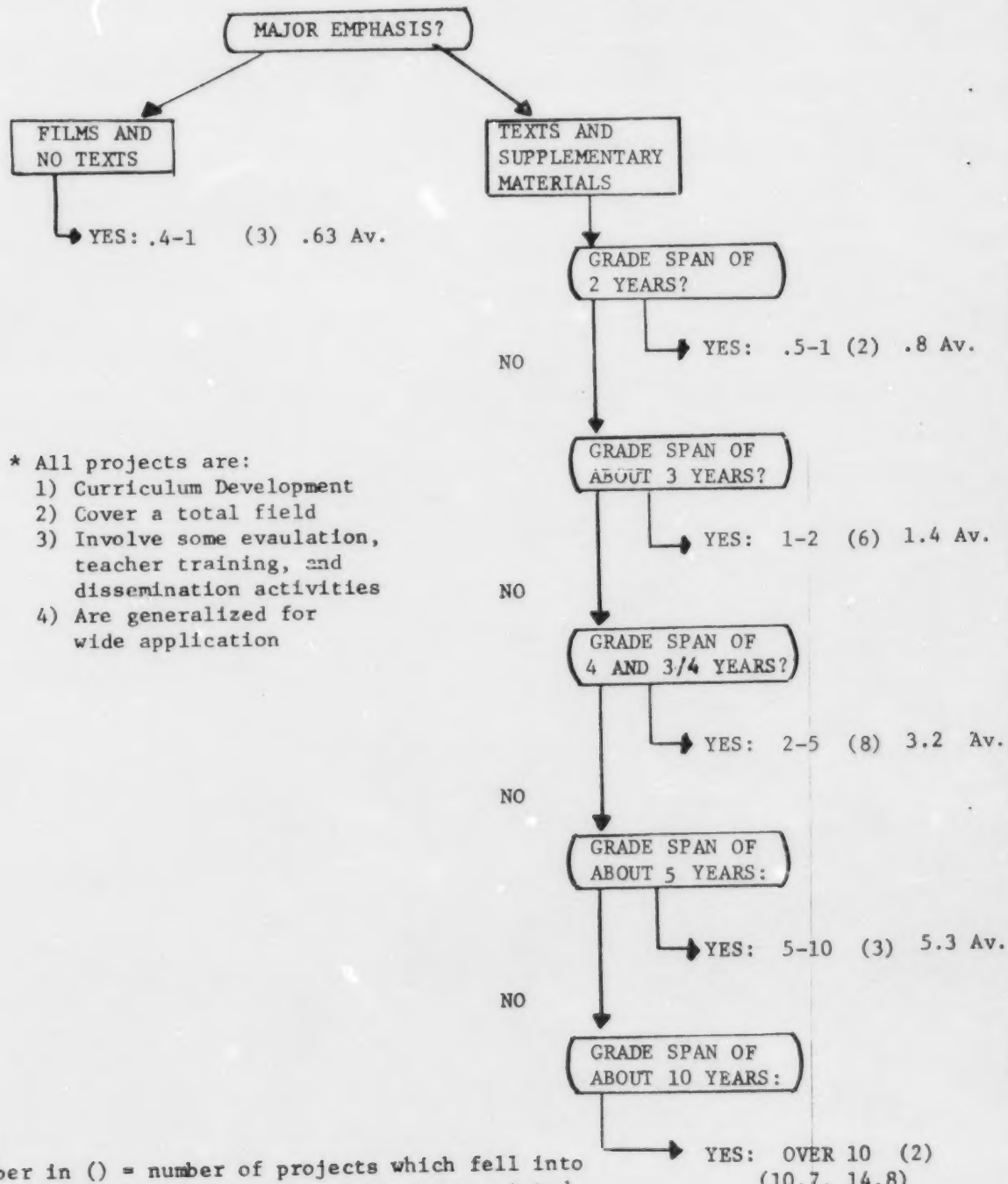
Over $10,000,000 Cost Group: (2)

Texts; grade span average of 10 years (2)

figure 11.

FLOW CHART FOR
COSTING NSF FUNDED
"PRINCIPAL CURRICULUM STUDY GROUP" PROJECTS* (26)

(dollars in millions)


MAJOR EMPHASIS?
FILMS AND NO TEXTS
TEXTS AND SUPPLEMENTARY MATERIALS
YES: .4-1 (3) .63 Av.
GRADE SPAN OF 2 YEARS?
YES: .5-1 (2) .8 Av.
NO
GRADE SPAN OF ABOUT 3 YEARS?
YES: 1-2 (6) 1.4 Av.
NO
GRADE SPAN OF 4 AND 3/4 YEARS?
YES: 2-5 (8) 3.2 Av.
NO
GRADE SPAN OF ABOUT 5 YEARS:
YES: 5-10 (3) 5.3 Av.
NO
GRADE SPAN OF ABOUT 10 YEARS:
YES: OVER 10 (2) (10.7, 14.8)

* All projects are:
1) Curriculum Development
2) Cover a total field
3) Involve some evaulation, teacher training, and dissemination activities
4) Are generalized for wide application

Number in () = number of projects which fell into that cost group or category. Cost groups stated in millions of dollars. Rule violators are not represented.

Comparable NSF Educational Projects Subjected to the Cost Rules

A sample of NSF educational projects described in the same brief paragraph format as those of the Office of Education projects was subjected to the cost rules of this report developed strictly on the O.E. data base. The sample is from projects of the Course Content Improvement Program (pre-college) initiated in FY 1971, and projects of the Science Curriculum Improvement Program (undergraduate) initiated in FY 1969. This set does not overlap with the former twenty-six Principal Curriculum Study Group"

Overall Results:

A total of twenty-eight NSF educational projects were subjected to cost ruled developed on the basis of Office of Education project data. The overall results are:

17 NSF educational projects conformed to the Office of Education developed cost rules

7 NSF educational projects violated the Office of Education developed cost rules (of these seven, four were of higher cost than predicted by the cost rules and three were of lower cost)

4 NSF educational projects were of a new kind and neither conformed to nor violated the cost rules

The breakdown of these results into component R&D project areas follows:

A) THEORETICAL, ANALYTICAL, AND EXPERIMENTAL STUDIES:

2 NSF rule violators (both of higher cost)

1 rule conformer

total of 3 NSF educational projects

B) SURVEYS:

1 rule violator (of higher cost)

total of 1 NSF educational projects

C) PROGRAM OF PRODUCT EVALUATIONS:

1 NSF rule conformer

total of 1 NSF educational project

D) DEVELOPMENT PROJECTS:

3 NSF rule violators (2 of lower cost, 1 of higher cost)

14 NSF rule conformers

total of 17 NSF educational projects

E) CONFERENCES, WORKSHOPS, SYMPOSIUMS, AND SEMINARS:

3 NSF projects of a new kind (neither rule conformers no violators)

total of 3 NSF educational projects

F) PROGRAM OF FUNCTION FACILITATION PROJECTS:

1 NSF rule violator (of lower cost)

1 NSF rule conformer

1 NSF project of a new kind (neither conformer nor violator)

total of 3 NSF educational projects

APPENDIX

FORMATS OF THE DATA MATRICES

FOR EACH R&D CATEGORY

THEORETICAL, ANALITICAL, AND EXPERIMENTAL STUDIES	
FOCUS:	General TOPIC
	ORG. EFFICIENCY
	CLASSROOM CLIMATE, OPS.
	LEARNING PROCED., METH.
	PERC-MOTOR SKILLS
LEVEL:	PRE-ELEM
	ELEM
	HIGH
	COLLEGE
# SUBJECTS:	
METH: 1)	LAB. Experimentation
	DESIGN & TEST/EQUIP.
	DESIGN & TEST/MEASURES
2)	LIT SEARCH/DATA ANALYS.
	AUTOMATIC DATA PROCES.
	NATL/INTERNATL DATA BS
	SUPPLEM. NEW SYST.DESN.
3)	INTERVIEWING
	SMALL SCALE
	LARGE SCALE
	ADM.EXISTING TESTS
	LONGITUDINAL
LENGTH:	
COST: (000):	

SURVEYS
POP.:
NATIONAL
CROSS NAT'L
STATE
DISTR
SCHOOL
INTERVIEW (00)
QUESTIONNAIRE (000)
LONGITUDINAL
LEVEL:
PRE-ELEM
ELEM
HIGH
COLLEGE
DISSEMINATION EFFORT
SUBSEQ. SYS. DESIGN
OR RECOMMENDATIONS
LENGTH:
COST: (000)

DEVELOPMENT:
CURRIC. OR MATERIALS

FOCUS:
- Subject Matter
- Classroom Operation
- Adm./Tech. Proc.

SCOPE:
- Total Curriculum
- One Field
- One Course
- Materials Only

FIELD:
- Language
- Math
- Science
- Social Studies
- Art/Music
- Voc. Ed.

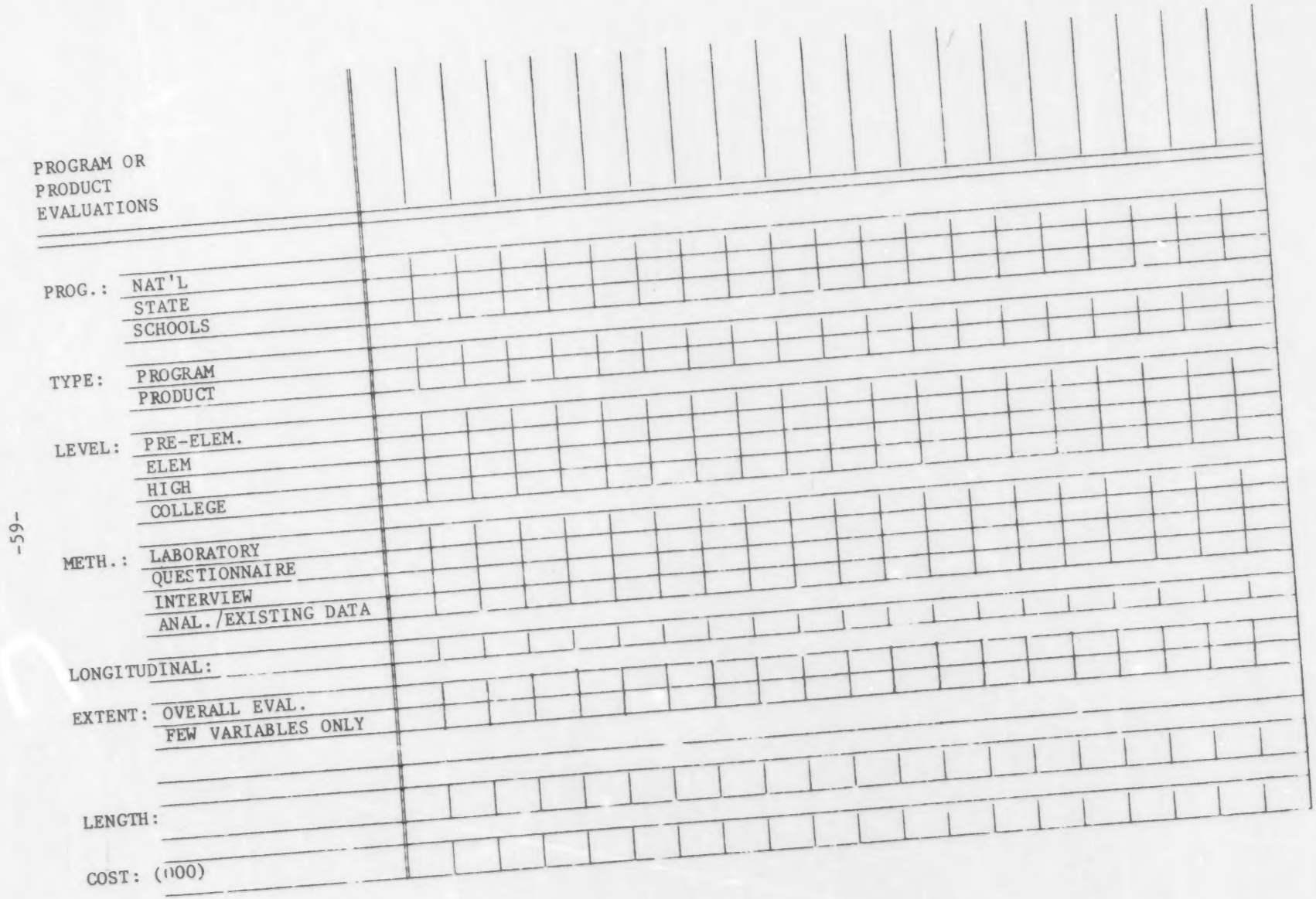
LEVEL:
- Pre-Elem.
- Elem.
- High School
- College
- Grades (or years)

PRODUCTS:
- Textbooks
- Workbooks
- Manuals/Guides
- TV
- Films
- Audio Equip.
- Displays
- Games
- Computer Prog./Syst.
- Lab Equipment
- Tests/Measures

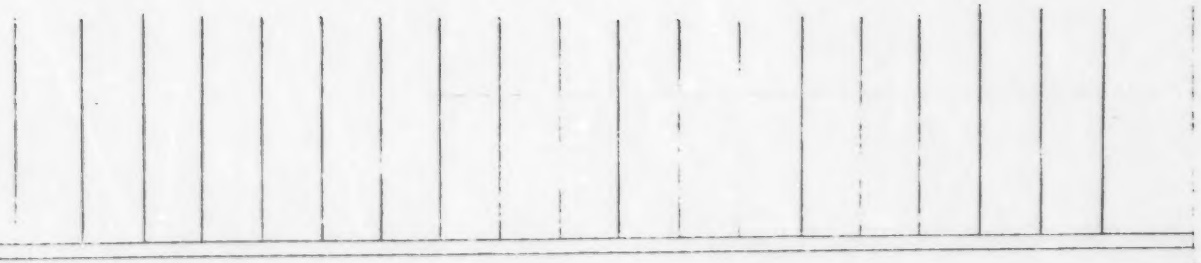
Evaluation:
Teacher Training:
Dissemination Effort:
Surveys/Conferences:

Generalized:
Targeted:

LENGTH:
COST:


PROGRAM OR
PRODUCT
EVALUATIONS
PROG.:
NAT'L
STATE
SCHOOLS
TYPE:
PROGRAM
PRODUCT
LEVEL:
PRE-ELEM.
ELEM
HIGH
COLLEGE
METH.:
LABORATORY
QUESTIONNAIRE
INTERVIEW
ANAL./EXISTING DATA
LONGITUDINAL:
EXTENT:
OVERALL EVAL.
FEW VARIABLES ONLY
LENGTH:
COST: (000)

TRAINING PROGRAMS IN
EDUCATIONAL RESEARCH



	PH.D. PROGRAM
	M.S. PROGRAM
	POST.DOC. FELLOWSHIP
	LENGTH: DAYS
	YEARS
	NUMBER OF SESSIONS
	NUMBER OF PARTICIPANTS
1.)	FIELD/TARGET SPECIFIC
2.)	INTERDISC. EMPHASIS
3.)	CONSORTIUM PROGRAM
4.)	FIELD LINK WITH DISTRICT
5.)	PROPOSED INSTITUTE
6.)	PRECONFERENCE SESSIONS
	LENGTH:
	COST (000):

CONFERENCES, WORKSHOPS, SYMPOSIUMS, AND SEMINARS

TYPE:
- CONFERENCE
- WORKSHOP
- SYMPOSIUM
- SEMINAR

SCALE:
- NATIONAL
- STATE OR LOCAL

NUMBER OF DAYS:

NUMBER OF ATTENDEES:

WRITERS OF BACKGROUND PAPERS:

ANALYSIS OR ACTUAL PLAN DEVELOPMENT BY ATTENDEES:

DISSEMINATION OF RESULTS:

LENGTH:

COST: (000)

R&D CENTERS AND
REGIONAL LABS

Type:	ERIC Center
	Regional Lab
Phase:	Prelim. Study Only
	Center Operation
Size:	# Partic. Univs.
	# Trainees
Focus:	1) Studies, Plans
	2) Dev. Material
	3) Dev. Theories
	4) Teach.,Adm. Training
	5) Student Training
	6) Evaluation
	7) Dissem., Demo.
	8) Testing Programs
	9) Mgt.,Org of Schools
	10) Coordination
Equip:	CAI
	TV Instr.
	Computer Facility
	Mass Media
	Prod. Capability
Length:	Years of Opera. Funded
Annual Cost of Operation(000):	

PROGRAM OR FUNCTION FACILITATION													
1.) Training Institute/Prog.													
Teachers (#)													
Evaluators (#)													
Adm. and Leaders (#)													
Multiple Institutes													
2.) Prog. Planning/Coord.													
3.) Demo./Dissem. Project													
4.) Facility Expansion													
Staff (#)													
Equipment													
Space													
5.) Consortiums (#)													
Research Dev.													
Teacher Training													
Length:													
Cost (000):													